Effectiveness of Heartworm Disease Preventative: Vectra®

Nikki Solano
41st Annual Meeting of GMCA
October 18th, 2018
Effectiveness of Heartworm Disease Preventative: Vectra 3D

Nikki Solano
41st Annual Meeting of GMCA
October 18th, 2018
Even if fleas had 9 lives, 2 hours would end them all.

Effectiveness of Heartworm Disease Preventative: Vectra 3D

Nikki Solano
41st Annual Meeting of GMAA
October 18th, 2018

It's extremely important to repel mosquitoes BEFORE they bite your dog. Ask your veterinarian how you can beat the buzzers with Vectra® 3D.
Heartworm (*Dirofilaria immitis*)

- **Larvae mature from L3 into L4 and infest the muscles and blood vessels.**
- **Adult worms mate and produce larvae (L1) that are released into the blood.**
- **An infected mosquito bites a healthy dog and transmits larvae (L3) to the dog’s subcutaneous tissues.**
- **The mosquito is the intermediate host and also acts as the vector.**
- **Within the mosquito, larvae mature from L1 into L3.**
- **The domestic dog is the primary host.**
Why Heartworm (*Dirofilaria immitis*)?

- People care about dogs!
- Can also infect cats, coyotes, foxes, ferrets, sea lions, humans, etc.
- Even though improvements seen in preventatives, awareness and diagnostic tests, we are still seeing high incidence.
People care about dogs!

Can also infect cats, coyotes, foxes, ferrets, sea lions, humans, etc.

Even though improvements seen in preventatives, awareness and diagnostic tests, we are still seeing high incidence.
Why Heartworm (*Dirofilaria immitis*)?

- People care about dogs!
- Can also infect cats, coyotes, foxes, ferrets, sea lions, humans, etc.
- Even though improvements seen in preventatives, awareness and diagnostic tests, we are still seeing high incidence.

**My role:** Assess the performance and effectiveness of *Vectra3D* through a mechanistic mathematical model.
Compartmental Model

S → E → I → T

I → E → S

Dog → Mosquito

MOS
Vector

\( S_V \xrightarrow{\text{exposure}} E_V \xrightarrow{\text{infection}} I_V \)

- \( S_V \): Susceptible
- \( E_V \): Exposed
- \( I_V \): Infected

- Births
- Death
Hypothetical model result

Number of cases prevented

Neighborhood coverage or Vectra3D® effectiveness (%)
Hypothetical model result

Density of Infectious Dogs ($I_H$)

- **Black Line**: Heartworm preventative only
- **Yellow Line**: Vectra3D alone
- **Red Line**: Vectra3D + heartworm preventative
- **Blue Line**: Vectra3D alone, pyrethroid resistance

Neighborhood Coverage
Mosquitoes not only suck, they can also kill.

LEARN MORE ABOUT THE IMPORTANCE OF KILLING MOSQUITOES

© 2016 Ceva Animal Health, LLC.
Mosquitoes not only suck, they can also kill.

Dog Wisdom: The only good mosquito is a dead one.

LEARN MORE ABOUT THE IMPORTANCE OF KILLING MOSQUITOES
© 2016 Ceva Animal Health, LLC.

LEARN MORE ABOUT HOW MOSQUITOES TRANSMIT HEARTWORM
© 2016 Ceva Animal Health, LLC.

http://goodnewsforpets.com/the-ceva-love-bus-rolls-again/
nsolano@uga.edu
Mosquitoes not only suck, they can also kill.

Dog Wisdom: The only good mosquito is a dead one.

What do Zika and heartworm have in common?

Find out how to stop mosquitoes.

LEARN MORE ABOUT THE IMPORTANCE OF KILLING MOSQUITOES
© 2015 Ceva Animal Health, LLC.

LEARN MORE ABOUT HOW MOSQUITOES TRANSMIT HEARTWORM
© 2015 Ceva Animal Health, LLC.

nsolano@uga.edu
Thank you!

Ceva Animal Health
Murdock Lab
Drake Lab

Mosquitoes not only suck, they can also kill.

LEARN MORE ABOUT THE IMPORTANCE OF KILLING MOSQUITOES
© 2016 Ceva Animal Health, LLC.

Dog Wisdom: The only good mosquito is a dead one.

LEARN MORE ABOUT HOW MOSQUITOES TRANSMIT HEARTWORM
© 2016 Ceva Animal Health, LLC.

What do Zika and heartworm have in common?
This girl.

http://goodnewsforpets.com/the-ceva-love-bus-rolls-again/
nsolano@uga.edu